REMARKS

By this Amendment, claim 1 is amended, claims 2-3 are cancelled, and claim 4 is added. Thus, claims 1 and 4 are active in the application. Reexamination and reconsideration of the application are respectfully requested.

The specification and abstract have been carefully reviewed and revised in order to correct grammatical and idiomatic errors in order to aid the Examiner in further consideration of the application. The amendments to the specification and abstract are incorporated in the attached substitute specification and abstract. No new matter has been added.

Also attached hereto is a marked-up version of the substitute specification and abstract illustrating the changes made to the original specification and abstract.

In item 2 on page 2 of the Office Action, claims 1-3 were rejected under 35 U.S.C. § 102(e) as being anticipated by Asakura et al. (U.S. 6,681,018, hereinafter "Asakura").

This rejection is respectfully traversed for the following reasons. Furthermore, the Applicant respectfully submits that this rejection is inapplicable to new claim 4 for the following reasons.

The present invention provides a multi-source surround apparatus having a structure for activating an analog surround effector to convert, regardless of whether a sound source is a DVD, each type of audio signal generated by the sound source to a 2ch (2 channel) analog surround audio signal, and outputting the converted 2ch analog surround audio signal.

In particular, the present invention provides that when a sound source is a DVD and an audio signal generated by the DVD is a 5.1ch (5.1 channel) digital audio signal, a digital sound effector is first used to convert the 5.1ch digital audio signal to a 2ch digital surround audio signal. Then, an analog surround effector is used to convert the converted 2ch digital surround audio signal to a 2ch analog surround audio signal.

Alternatively, the present invention provides that when the sound source is a DVD and an audio signal generated by the DVD is a 2ch digital audio signal, the analog sound effector is used to convert the 2ch digital audio signal to a 2ch analog surround audio signal.

Still alternatively, the present invention provides that when the sound source is not a DVD, the analog sound effector is used to convert an audio signal generated by the sound source to a 2ch analog surround audio signal.

Accordingly, the multi-source surround audio apparatus of the present invention provides the following conversions (A)-(C) to an audio signal generated by a sound source.

(A) When the sound source is a DVD and the audio signal generated by the DVD is a 5.1ch digital audio signal:

5.1ch digital audio signal
↓ (conversion performed by digital sound effector)
2ch digital surround audio signal
↓ (conversion performed by analog sound effector)
2ch analog surround audio signal

(B) When the sound source is a DVD and the audio signal generated by the DVD is a 2ch digital audio signal:

2ch digital audio signal
↓ (conversion performed by analog sound effector)
2ch analog surround audio signal

(C) When the sound source is not a DVD
Audio signal generated by the non-DVD sound source
↓ (conversion performed by analog sound effector)
2ch analog surround audio signal

Therefore, the multi-source surround audio apparatus of the present invention eventually uses the common analog surround effector to output a 2ch analog surround audio signal regardless of whether the inputted audio signal is a 5.1ch digital audio signal

generated by a DVD, a 2ch digital audio signal generated by a DVD, or any audio signal generated by a sound source that is not a DVD. With this advantageous and novel feature, the present invention provides a remarkable effect in that surround sound reproduction of any type of audio signal which is similar to that of a 2ch analog surround audio signal can be realized even if an expensive 5.1ch loudspeaker system is not available.

Furthermore, in the case where a sound source including a DVD contains both a 5.1ch audio signal and a 2ch audio signal, the multi-source surround audio apparatus of the present invention enables an appropriate surround effector to be automatically applied depending on the type of the audio signal to be reproduced, which thereby enables each type of audio signal to be eventually reproduced as a 2ch analog surround audio signal and outputted through an existing speaker assembly.

Therefore, the present invention provides that, irrespective of the type of audio signal that is generated by a sound source, a natural sound effect can be provided just by causing a user to select multi-source surround audio signals (i.e., a plurality of different sound sources).

Claims 1 and 4 recite the above-described features of the present invention and achieve the advantageous effects thereof.

In particular, claims 1 and 4 recite a multi-source surround audio apparatus comprising a sound source detection unit (means) for detecting a sound source of an inputted audio signal based on the instruction from the user, and a DVD audio signal reproduction unit (means) for, if the detected sound source is a DVD, reproducing the DVD to generate a DVD reproduced audio signal. Further, the apparatuses of claims 1 and 4 are recited as comprising an audio signal reproduction unit (means) for, if the detected sound source is not a DVD, extracting an audio signal from the sound source of the inputted audio signal and generating a reproduced audio signal therefrom, and a reproduced signal determination unit (means) for determining whether the DVD reproduced audio signal is a 5.1-channel digital surround audio signal or a 2-channel digital audio signal and generating a determination signal indicating a result of the determination.

In addition, the apparatuses of claims 1 and 4 are recited as comprising a digital surround effector for, if the determination signal generated by the reproduced signal determination unit (means) indicates that the DVD reproduced audio signal is a 5.1-channel digital surround audio signal, converting the DVD reproduced audio signal to a 2-channel digital surround audio signal, and an analog surround effector for converting an audio signal to a 2-channel surround audio signal.

Further, the apparatuses of claims 1 and 4 are recited as comprising a first effector driving unit (means) for, if the determination signal generated by the reproduced signal determination unit (means) indicates that the DVD reproduced audio signal is a 2-channel digital audio signal, activating the analog surround effector to convert the DVD reproduced audio signal to a 2-channel surround audio signal, and a sound effector driving unit (means) for activating the analog surround effector to convert the reproduced audio signal to a 2-channel surround audio signal. In addition, claims 1 and 4 each recite that the first effector driving unit (means) is operable to activate the analog surround effector to convert the 2-channel surround audio signal converted by the digital surround effector to a 2-channel surround audio signal.

By these structural elements, the apparatuses of claims 1 and 4 achieve the conversions (A)-(C) described above and the advantageous effects obtained therefrom.

Asakura discloses an audio signal processing apparatus that performs surround processing and channel conversion of an audio signal which can convert a 2ch signal into a 5.1ch signal, or vice versa (see Column 6, line 61 to Column 7, line 4).

However, the audio signal processing apparatus of Asakura is not disclosed or suggested as employing a common analog surround effector to output an audio signal, as recited in claims 1 and 4. Namely, Asakura merely discloses that a 2ch signal can be converted to a 5.1ch signal, and that a 5.1ch signal can be converted to a 2ch signal.

Asakura, however, does not disclose or suggest that when a sound source is a DVD and an audio signal generated by the DVD is a 5.1ch digital audio signal, a digital sound effector is first used to convert the 5.1ch digital audio signal to a 2ch digital surround audio signal, and then an analog surround effector is used to convert the converted 2ch digital surround audio signal to a 2ch analog surround audio signal, as recited in claims 1 and 4.

Further, Asakura does not disclose or suggest that a 2ch digital audio signal generated by a DVD source or an audio signal generated by a non-DVD source is converted to a 2ch analog surround audio signal, as recited in claims 1 and 4.

Accordingly, in contrast to the inventions of claims 1 and 4, Asakura does not disclose or suggest that a surround sound reproduction of any type of audio signal, whether it be a 5.1 digital audio signal, a 2ch digital audio signal or an audio signal generated by a non-DVD source, is achieved similar to that of a 2ch analog surround audio signal even if an expensive 5.1 loudspeaker system is not available.

Therefore, in view of the foregoing reasons, the Applicant respectfully submits that claims 1 and 4 are clearly not anticipated by Asakura since Asakura fails to disclose or suggest each and every limitation of claims 1 and 4.

Furthermore, in view of the clear distinctions discussed above, the Applicant respectfully submits that a person having ordinary skill in the art at the time the invention was made would not have been motivated to modify Asakura in such a manner as to result in, or otherwise render obvious, the present invention as recited in claims 1 and 4.

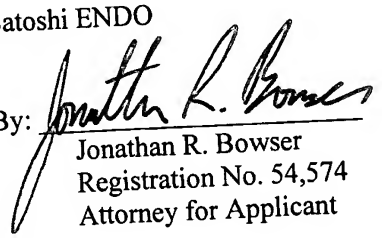
Therefore, it is submitted that the claims 1 and 4 are clearly allowable over the prior art as applied by the Examiner.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. An early notice thereof is respectfully solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

Satoshi ENDO

By: 
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